

Monthly Marine Biotoxin Report

November 2014

Technical Report No. 14-20

INTRODUCTION:

This report provides a summary of biotoxin activity for the month of November, 2014. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

Southern California Summary:

Paralytic Shellfish Poisoning

Alexandrium was not observed at any Southern California sites in November (Figure 1). PSP toxins were not detected in any shellfish samples collected throughout the month (Figure 3).

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Figure 1. Distribution of toxin-producing phytoplankton in Southern California during November, 2014.

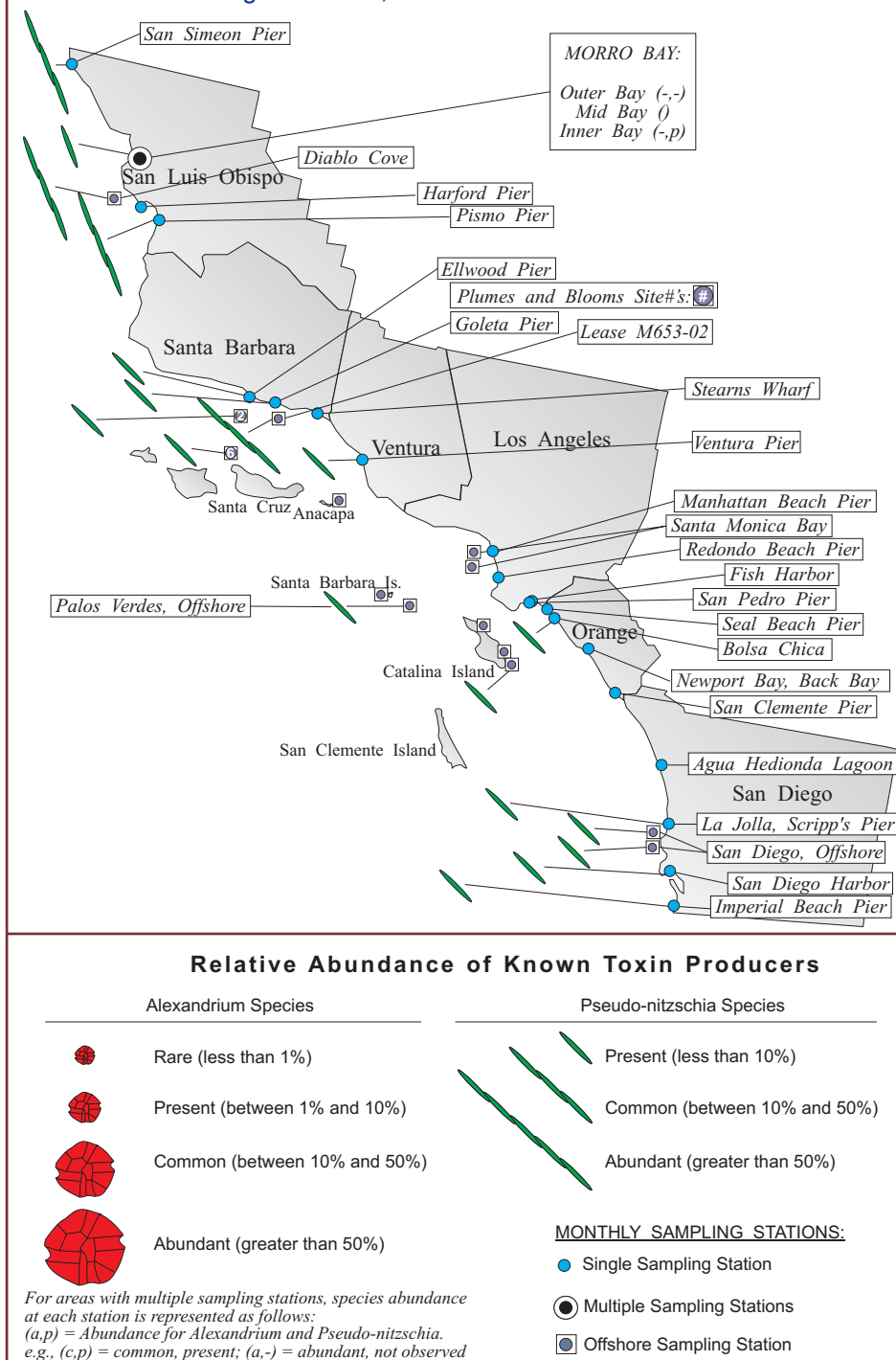
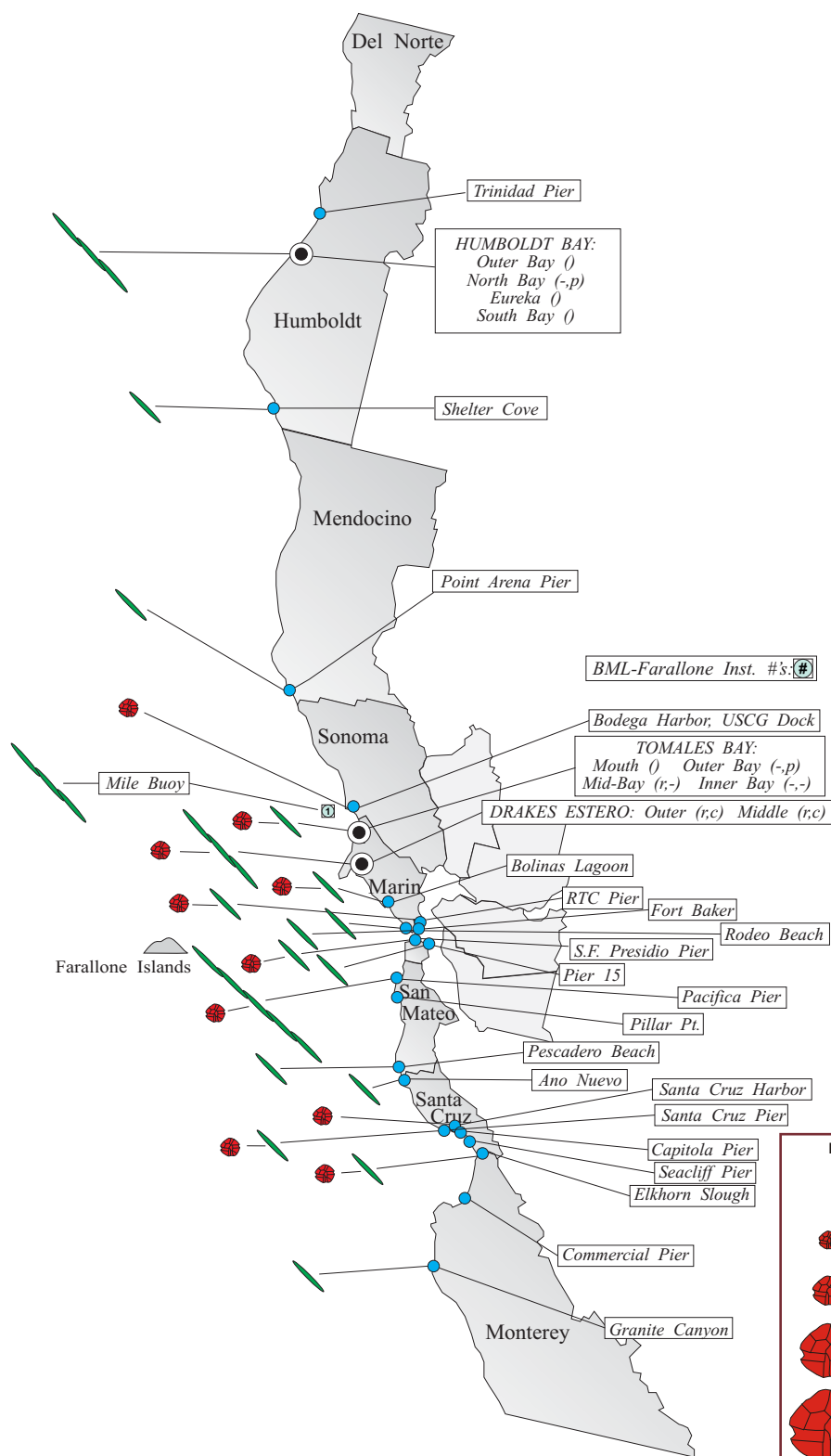


Figure 2. Distribution of toxin-producing phytoplankton in Northern California during November, 2014.



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Domoic Acid

Pseudo-nitzschia was observed in every county along the entire southern California coast and at over half of all sampling sites (Figure 1). The percent composition of this diatom decreased at most stations, particularly in San Luis Obispo and Santa Barbara counties. The cell mass was low at all locations.

Domoic acid was not detected in any bivalve shellfish samples collected in November. A single lobster viscera sample collected offshore of Ventura county was also non-detect for Domoic acid.

Non-Toxic Species

The diatom *Chaetoceros* remained common to abundant along the southern California coast. The dinoflagellate *Ceratium* was common at Pismo Pier. Diatoms dominated the rest of the coast, with *Asterionella* common at various locations and *Bacteriastrum* common at sites in Ventura, Los Angeles and San Diego counties.

Northern California Summary:

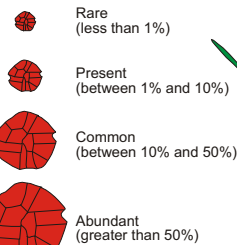
Paralytic Shellfish Poisoning

Alexandrium was observed at several sampling sites between Sonoma and Monterey counties (Figure 2). Cell numbers

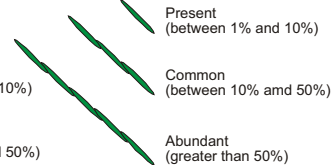
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Relative Abundance of Known Toxin Producers

Alexandrium Species



Pseudo-nitzschia Species



MONTHLY SAMPLING STATIONS:

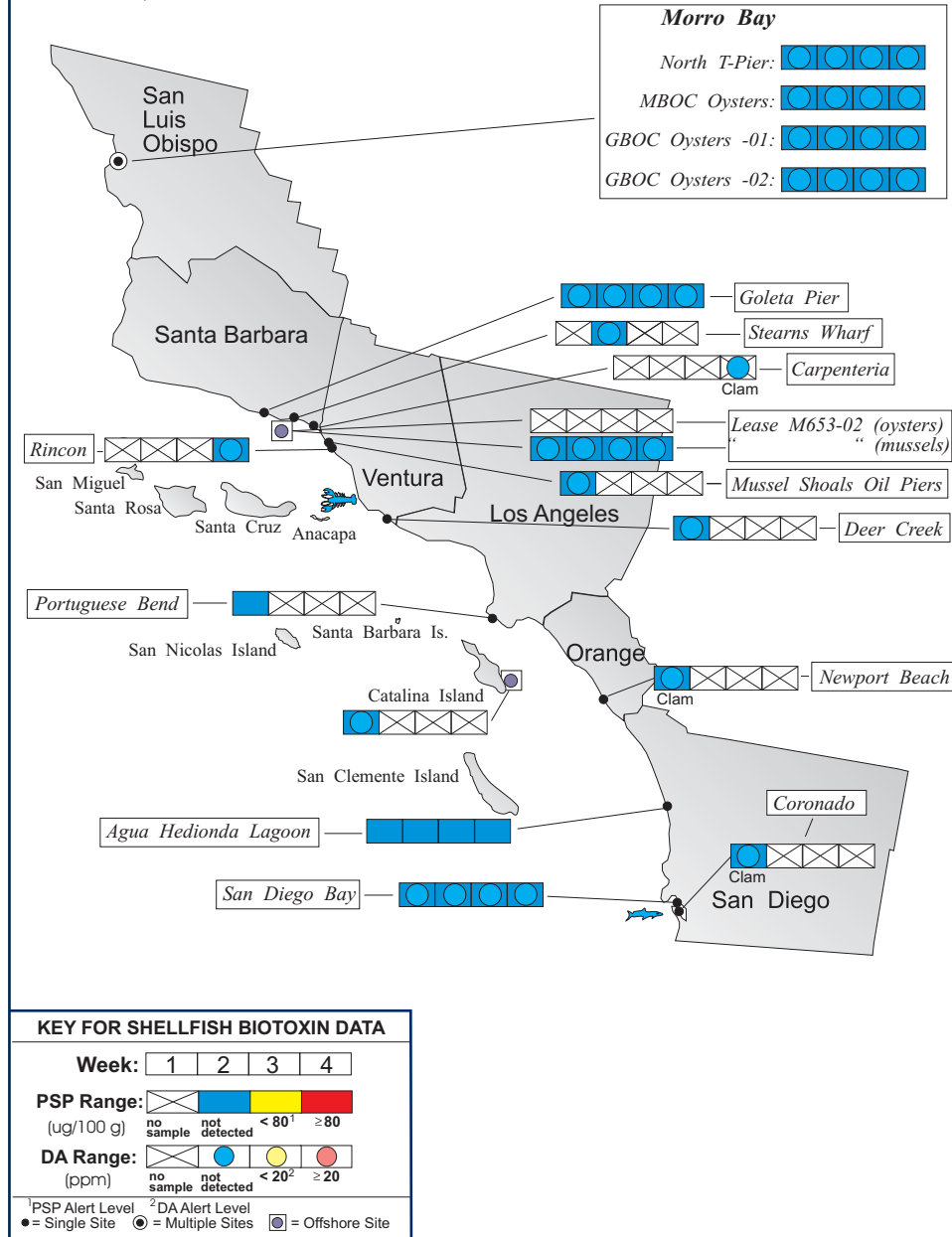
- Single Sampling Station
- ⊙ Multiple Sampling Stations
- ⊙ Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.
e.g., (c,p) = common, present; (a,-) = abundant, not observed

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Figure 3. Distribution of shellfish biotoxins in Southern California during November, 2014.



were low at all sites. At Santa Cruz Pier, *Alexandrium* was observed during the last three weeks of November.

Low levels of PSP toxins were detected in a razor clam sample collected at Doran Beach (Sonoma County) on November 6 and in mussel samples collected at the end of the month at Santa Cruz Pier and Drakes Estero (Marin County) (Figure 4).

Domoic Acid

Pseudo-nitzschia was observed at sites in all represented coastal counties in November, decreasing at most sites compared to observations in October (Figure 2). The cell mass was low at all locations.

Low levels of domoic acid were detected in a razor clam sample from Doran Beach (Sonoma County) (Figure 4).

Non-Toxic Species

A mix of diatoms (*Chaetoceros*) and dinoflagellates were observed along the coast. The dinoflagellate *Prorocentrum micans* was common at the Santa Cruz Pier and the dinoflagellate *Ceratium furca* was common offshore of Boedga Bay (Sonoma County). Diatoms *Licmophora* and *Melosira* were common in Tomales Bay (Marin County).



The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Public Health, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide effort designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:
(510) 412-4635

For Recorded Biotoxin Information Call:
(800) 553-4133

QUARANTINES:

The annual mussel quarantine ended at midnight on October 31 for all coastal counties except for Ventura county.

On October 10 a health advisory was issued warning consumers not to eat recreationally harvested bivalve shellfish, such as mussels, clams or whole scallops, as well as the internal organs of lobster or crab taken from Ventura county. This alert was issued due to high levels of domoic acid in samples of lobster viscera, also known as lobster "tomalley".

Consumers of Washington clams, also known as butter clams (*Saxidomus nuttalli*), are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon and can remain toxic for a long period of time. Persons taking scallops or clams, with the exception of razor clams, are advised to remove and discard the dark parts (i.e., the digestive organs or viscera). Razor clams (*Siliqua patula*) are an exception to this general guidance due to their ability to concentrate and retain domoic acid in the edible white meat as well as in the viscera.

PSP toxins can produce a tingling around the mouth and fingertips within a few minutes to a few hours after eating toxic shellfish. These symptoms can be followed by disturbed balance, lack of muscular coordination, slurred speech and difficulty swallowing. In severe poisonings, complete muscular paralysis and death from asphyxiation can occur.

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Figure 4. Distribution of shellfish biotoxins in Northern California during November, 2014.

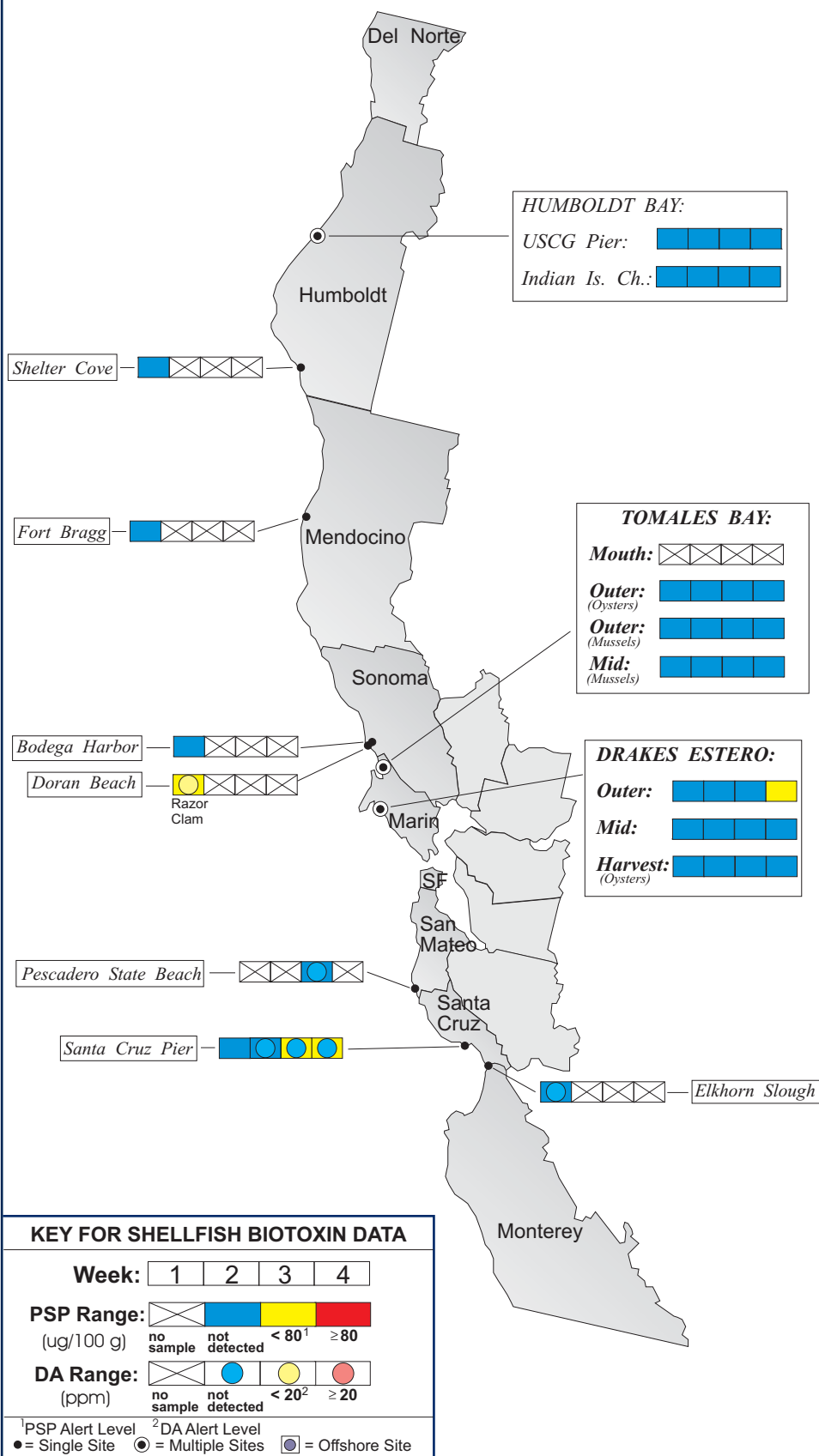


Table 1. Program participants collecting phytoplankton samples during November, 2014. (Continued from Page 4)

AGENCY	#	AGENCY	#
DEL NORTE COUNTY			
HUMBOLDT COUNTY		Bureau of Land Management	2
Coast Seafood Company	4	Humboldt State University Marine Lab	2
MENDOCINO COUNTY		CDPH Volunteer (<i>Marie DeSantis</i>)	2
SONOMA COUNTY			
CDPH Marine Biotoxin Program	1	Bodega Marine Lab	1
MARIN COUNTY		Marine Biotoxin Program CDPH	2
Golden Gate National Rec. Area	1	CDPH Volunteer (<i>Anderson, Clyde</i>)	6
SFSU, Romberg Tiburon Center	2	Hog Island Oyster Company	2
Drakes Bay Oyster Company	8	NatureBridge	1
SAN FRANCISCO COUNTY			
CDPH Volunteer (<i>Eugenia McNaughton</i>)	3	Exploratorium	2
SAN MATEO COUNTY		The Marine Mammal Center (<i>Stan Jensen</i>)	4
San Mateo County Environmental Health Dept.	6	U.C. Santa Cruz - Ano Nuevo	1
SANTA CRUZ COUNTY		U.C. Santa Cruz	4
Santa Cruz County Environmental Health Dept	3	San Lorenzo Valley High School	3
MONTEREY COUNTY		Friends of the Sea Otter (<i>Janis Chaffin</i>)	4
Monterey Abalone Company	1	Marine Pollution Studies Laboratory	1
SAN LUIS OBISPO COUNTY			
Morro Bay National Estuary Program	1	Morro Bay Oyster Company	4
Coastal Discovery Center, San Simeon	4	Tenera Environmental	4
Friends of the Sea Otter (<i>Cherry, Carducci</i>)	5	CDPH Volunteer (<i>Vince Shay</i>)	3
SANTA BARBARA COUNTY			
HABNet/CDPH Volunteers (<i>Amiri</i>)	2	Ty Warner Sea Life Center/HABNet	1
Tole Mour	1	Santa Barbara Mariculture Company	4
CDPH Volunteer (<i>Sylvia Short</i>)	3	U.C. Santa Barbara	4
VENTURA COUNTY			
CDPH Volunteer (<i>Fred Burgess</i>)	3	National Park Service	2
LOS ANGELES COUNTY		Southern California Marine Institute	1
Tole Mour	1	Los Angeles County Health Department	4
Los Angeles County Sanitation District	2	CDPH Volunteers (<i>Cal Parsons</i>)	1
City of Los Angeles Envi. Monitoring Division	3	Catalina Island Marine Institute	1
ORANGE COUNTY			
California Department of Fish and Wildlife	3	National Oceanic and Atmospheric Admin.	1
CDPH Volunteer (<i>Truong Nguyen</i>)	2	Amigos de Bolsa Chica	4
SAN DIEGO COUNTY		Carlsbad Aquafarms, Inc.	1
Scripps Institute of Oceanography	4	Sea Camp/HABNet	2
U.S. Navy Marine Mammal Program	4	Tijuana River National Estuary Research	5

Symptoms of domoic acid poisoning can occur within 30 minutes to 24 hours after eating toxic seafood. In mild cases, symptoms of exposure to this nerve toxin may include vomiting, diarrhea, abdominal cramps, headache and dizziness. These symptoms disappear completely within several days. In severe cases, the victim may experience excessive bronchial secretions, difficulty breathing, confusion, disorientation, cardiovascular instability, seizures, permanent loss of short-term memory, coma and death.

Any person experiencing any of these symptoms should seek immediate medical care. Consumers are also advised that neither cooking or freezing eliminates domoic acid or the PSP toxins from the shellfish tissue. These toxins may also accumulate in the viscera of seafood species such as crab, lobster, and small finfish like sardines and anchovies, therefore these tissues should not be consumed. Contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.



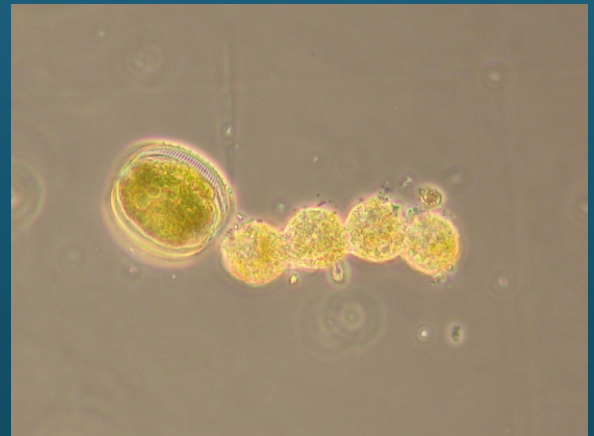
Table 2. CDPH program participants submitting shellfish samples during November, 2014.

COUNTY	AGENCY	#
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	8
	CDPH Volunteer (<i>Steve Fox</i>)	1
Mendocino	Mendocino County Environmental Health Department	1
Sonoma	CDPH Marine Biotoxin Program	1
	CDPH Volunteer (<i>Charles Horn</i>)	1
Marin	Cove Mussel Company	4
	Drakes Bay Oyster Company	16
	CDPH Marine Biotoxin Program	2
	Hog Island Oyster Company	4
	Tomales Bay Oyster Company	4
San Francisco	None Submitted	
San Mateo	San Mateo County Environmental Health Department	3
Santa Cruz	U.C. Santa Cruz	4
Monterey	CDPH Volunteer (<i>Kathrine Neylan</i>)	1
San Luis Obispo	Grassy Bar Oyster Co.	10
	Morro Bay Oyster Company	6
Santa Barbara	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	4
	Ty Warner Sea Life Center/HABNet	1
	CDPH Volunteer (<i>Jon Schneider</i>)	1
Ventura	Ventura County Environmental Health Department	2
	CDPH Volunteer (<i>Bill Weinerth, Jon Schneider</i>)	2
Los Angeles	CDPH Volunteer (<i>Cal Parsons</i>)	1
	Los Angeles County Health Department	2
Orange	CDPH Volunteer (<i>Steve Croke</i>)	1
San Diego	Carlsbad Aquafarms, Inc.	4
	U.S. Navy Marine Mammal Program	5
	CDPH Volunteer (<i>Steve Croke</i>)	1

PHYTOPLANKTON GALLERY



The outer cell wall or silica frustule of the chain diatom *Odontella*.



A centric diatom and some of the unarmored dinoflagellate *Cochlodinium*. The *Cochlodinium* cells have lost their structure and have 'exploded' in the preservative.



Zooplankton such as these copepods were common at some locations.